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for management of whiplash associated disorders

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Objectives: This study aimed to develop and evaluate an evidence based educational booklet on whiplash associated disorders.

Methods: A comprehensive review of the available scientific evidence produced a set of unambiguous patient centred messages that challenge unhelpful beliefs about whiplash and promote an active approach to recovery. These messages were incorporated into a novel booklet, which was then evaluated qualitatively for end user acceptability and its ability to impart the intended messages, and quantitatively for its ability to improve beliefs about whiplash and what to do about it. The subjects comprised people attending accident and emergency or manipulative practice with a whiplash associated disorder, along with a sample of workers without a whiplash associated disorder (n = 142).

Results: The qualitative results showed that the booklet was considered easy to read, understandable, believable, and conveyed its key messages. Quantitatively, it produced a substantial statistically significant improvement in beliefs about whiplash among accident and emergency patients (mean 6.5, 95% CI 3.9 to 9.1, p < 0.001), and among workers (mean 9.4, 95% CI 7.9 to 10.9, p < 0.001), but the shift in the more chronic manipulation patients was substantially smaller (mean 3.3, 95% CI 0.5 to 6.1, p < 0.05).

Conclusions: A rigorously developed educational booklet on whiplash (*The Whiplash Book*) was found acceptable to patients, and capable of improving beliefs about whiplash and its management; it seems suitable for use in the accident and emergency environment, and for wider distribution at the population level. A randomised controlled trial would be required to determine whether it exerts an effect on behaviour and clinical outcomes.

Whiplash associated disorders (WAD) after road traffic accidents remain a substantial clinical and social problem. Although many cases of WAD seem to recover within days or weeks with no lasting effects,¹ UK figures indicate that around 50% of patients do not recover by three months,² and 25% have residual disability at six months;³ many of these patients remain symptomatic for two years or more.^{2,4} There is considerable individual variation in recovery rates,⁵ as well as differences across countries,⁶ social groups,⁷ and compensation systems,⁸ suggesting that the progression to chronicity is not primarily driven by physical injury characteristics. A substantial body of evidence points to psychological and social factors as determinants of persisting pain and disability in WAD.^{5,9,10}

The Quebec Task Force on whiplash associated disorders¹¹ recommended that the most helpful management approach is likely to include positive advice on a number of parameters including prognosis, fear avoidance beliefs, exercise and sport, and return to work. It is convenient and appropriate to present such information in written form, but that material varies considerably in form and content. In an unpublished survey of 110 National Health Service A&E departments in UK (A Auty 2001, personal communication), 29 provided examples of advice sheets, leaflets, and booklets that they offered to patients with WAD while 12 specifically indicated they did not use any. Eighteen of the 29 were commercially produced advice cards bearing the name and contact number of a local solicitor. It was found that the advice was generally not evidence based and did not target the fundamental issues identified by the Quebec Task Force.

The Patient's Charter¹² recognises that patients want and seek information and advice on health complaints, and promises patients the right to that information. A detailed investigation of patient information for a variety of health

complaints,¹³ has suggested that good quality information can help promote self care, support treatment choices, and improve effectiveness of clinical care. However, the process for producing accurate, acceptable, and effective patient educational material is far from simple,¹⁴ and much patient information material exhibits significant flaws (for example, poor general quality, inaccurate, and out of date content, uncertainties ignored, and unreliable information on treatment effectiveness).¹⁵

The aim of this study was to rigorously develop an evidence based educational booklet on WAD, and to evaluate its suitability for a range of potential end users. It was hypothesised that the booklet would be acceptable to readers, and that the key messages would produce a positive shift in beliefs about the nature of the injury and what to do about it.

METHODS

Following recommendations for developing patient information,^{13,14} and the development for a similar publication for back pain patients,¹⁵ the structured development and evaluation process for the new booklet comprised eight essential phases.

1 Literature review

A comprehensive review of the scientific literature on WAD was conducted to formulate an evidence based set of patient centred messages for WAD patients, and has been published separately.¹⁶ Briefly, the review involved a systematic search for papers on whiplash published between 1994 and 2001, from which evidence statements were derived, linked to the literature, and graded for their consistency in order to prioritise the booklets' messages.

2 Authoring the text

With the evidence statements confirmed, a multidisciplinary team of three authors (TM, AKB, GW) compiled the narrative of the booklet. This was written in the simple unambiguous language used successfully for *The Back Book*,¹⁷ which deliberately demedicalised the condition and promoted a positive approach with a focus on self help. The key messages can be summarised as: there has been no serious damage; the acute pain will improve relatively quickly; use analgesics and do simple exercises; avoiding activity slows recovery; daily activities and early return to work are helpful; a positive active approach is important to avoid long term problems. (Further details on the evidence statements and derived messages can be found in the previous publication¹⁶).

3 Peer review

The draft text was sent to 10 reviewers with a special interest in WAD: orthopaedic surgeon, A&E consultant, pain consultant, clinical psychologist, research physiotherapist, research osteopath, NHS clinical manager, medical educationalist, scientific editor, and senior solicitor.

4 Refining of text

The reviewers made a variety of comments with regard to inclusion/exclusion of material and justification of messages. Their suggestions were fully discussed between by the authors; most were accepted and the text was revised accordingly.

5 Format and graphics

The format of the text and layout of the booklet were decided in conjunction with professional design experts from the proposed publisher (The Stationery Office), and a graphic artist provided contemporary illustrations. A mock up version of the booklet with full artwork and revised text was printed for the end user evaluations.

6 End user evaluation

The evaluation process was both qualitative and quantitative, involving evaluation of the overall acceptability, and comprehension of the messages, together with measurement of the effect on beliefs about WAD. Samples of convenience were drawn from three population groups: workers without current WAD (n = 79); WAD patients attending A&E (n = 50); WAD patients attending private manipulative (osteopathic) practice (n = 13). Steps were taken to encourage response to the questionnaires; the workers were told that their response would generate a donation to charity, while the patients were offered a book token.

The “acceptability” and “comprehension” questionnaires have been described previously for a similar purpose,¹⁵ while beliefs were assessed using the Whiplash Beliefs Questionnaire (WBQ) which was based closely on the Back beliefs Questionnaire (BBQ) previously validated for low back pain.¹⁸

The acceptability questionnaire was a tick box instrument inquiring on issues such as ease of reading, length, clarity, informative content, and believability. The comprehension questionnaire comprised open-ended questions inquiring on the messages and their perceived effect; subjects were asked to state the most important perceived messages, and also how the booklet might change what they would do about a whiplash injury. The WBQ explores beliefs and attitudes about the inevitable consequences of WAD, which are scored on a five point Likert scale ranging from “completely agree” to “completely disagree”. There are nine questions, so possible scores range from 9 (representing complete agreement with all statements) to 45 (representing complete disagreement); lower scores indicate more positive beliefs.

Principal components analysis confirmed that this new instrument comprised the single psychometric dimension found for the BBQ.

Participants were given an information sheet describing the evaluation process and their part in it. To assess baseline beliefs about WAD, each participant was given the WBQ to complete. They were then given the booklet and asked to read it carefully; after a few days they were asked to fill out the qualitative questionnaires and a second WBQ.

7 Final refinement of booklet

The qualitative evaluation raised slight concerns in respect of readability, length, and believability (see results). A number of revisions were made to address those matters.

8 Publication

Agreement was reached with The Stationery Office to obtain an international standard book number, secure appropriate cataloguing, and facilitate distribution. The final draft of the text and graphics was printed and published as a 28 page booklet entitled *The Whiplash Book*.¹⁹

RESULTS

One hundred and forty two subjects (aged 16 to 64 years) returned evaluation questionnaires. The responses to the acceptability questionnaire are given in table 1. Complete responses were available from 110 subjects. For all sections the vast majority gave positive responses, indicating a high level of acceptability. Two sections gave useful feedback on the presentation: although none of the respondents found the draft booklet difficult to read, 76% considered it “quite” easy as compared with “very” easy to read, and 15% considered it too long. Two sections were helpful regarding the content: most respondents (86%) said they gained new information, but 14% either felt they knew the information already or did not find it helpful; the messages were said to be believable by 86%, but 14% believed only some or none of the messages.

The results from the comprehension questionnaire indicated that respondents generally understood the key messages in the booklet. Of the 110 respondents, 85% recalled at least one of the primary messages (some respondents reported more than one message). The predominant messages recalled were: “keep active/do exercises”—60%; “permanent damage is rare/expect a good prognosis”—24%; “take control yourself”—22%. Two people (1.8%) did not recall any message. In terms of behavioural influence, 77% of

Table 1 Subjects’ responses to the acceptability questionnaire (n = 110)

Responses	%
Very easy to read	24
Quite easy to read	76
I found it interesting	99
I thought the information was clear	98
I learned some new, helpful things	86
I knew most of it anyway	12
Length is about right	81
It is too long	15
I believed most of what it said	86
I believed some of what it said	13
The pictures helped explain things better	96
The exercises were clearly explained and easy to follow	99
I think it will help people	98
I would recommend it to someone if they had a car accident	98
I liked the overall presentation	96

Table 2 Mean values (SD) for Whiplash Beliefs Questionnaire scores before and after reading the draft booklet, for the three groups of subjects, together with 95% confidence intervals for the shifts in score (lower scores represent more positive beliefs: a score of 9 represents complete belief in statements, while 45 represents complete disbelief)

	Before	After	Shift	95% CI
Workers (n=75)	24.2 (6.4)	14.9 (5.6)	9.4 (6.6)	7.9 to 10.9
A&E patients (n=24)	21.1 (5.8)	14.7 (4.4)	6.5 (6.1)	3.9 to 9.1
Manipulation patients (n=12)	24.8 (6.0)	21.5 (7.8)	3.3 (4.4)	0.5 to 6.1
Overall (n=111)	23.6 (6.3)	15.5 (6.0)	8.1 (6.6)	6.9 to 9.3

Statistical significance of differences between mean scores tested by two sided paired *t* test: $p < 0.001$, except for the shift experienced by the manipulation patients where $p < 0.05$.

subjects reported that the booklet would change what they would do if they experienced a WAD (some respondents reported more than one influence). The predominant reported behaviours were: "avoid inactivity/do exercises"—67%; "be positive about speed of recovery"—20%. Only 2% said they would go to GP and 6% reported the booklet would not effect what they did. Overall, two people (1.8%) expressed a hostile response to the messages, considering them dangerous or useless.

One hundred and eleven subjects (78%) completed WBQ scores both before and after reading the draft booklet. The results, tabulated by study group, are given as means and 95% confidence intervals (95% CI) in table 2. There was a statistically significant improvement in belief scores for all three groups, although the magnitude differed between groups. The greatest mean shift occurred in the workers followed by the A&E patients, while the osteopathic patients showed the smallest shift. A one way analysis of variance revealed there was a statistically significant difference in mean shift between the workers and the manipulation patients ($p = 0.007$, 95% CI 1.4 to 10.7), but no significant difference between the shifts for workers and A&E patients ($p > 0.1$, 95% CI 0.6 to 6.4). Analysis of variance showed that age and sex had no statistically significant influence either on the baseline WBQ scores or the shift in scores.

DISCUSSION

So far as we are aware, *The Whiplash Book* is the first evidence based patient educational booklet for WAD that has been developed and evaluated in a structured fashion. To ensure accuracy and currency, patient centred messages were derived from a comprehensive review of the scientific literature.¹⁶ The resultant booklet, having been rigorously developed, peer reviewed, and revised, offers a very different type of patient information for WAD, which challenges the traditional advice based on a biomedical model. Rather, the thrust follows a biopsychosocial model, demedicalises the problem, and promotes an active self management approach, in which the messages are delivered in simple unambiguous language.

Positive end user perceptions of style, presentation, and content are seen as a necessary feature of effective patient educational material.¹⁴ The evaluation showed that the novel approach adopted for this booklet is well accepted by patients, that the intended messages are assimilated, and that that is associated with the hypothesised improvement in beliefs about the consequences of whiplash.

It is of some interest that the three subject groups differed in their belief shift after reading the booklet. The largest change occurring in the non-injured workers may indicate that an absence of injury increases the believability of the messages. Conversely, the small change in the manipulation patients may be the result of the relative chronicity of their symptoms; it is reasonable to suppose they had more entrenched negative beliefs that were more difficult to

overcome. Despite their acute symptoms the A&E patients showed a substantial improvement in beliefs. Arguably, the earlier a patient receives the information, the greater the chance of improving beliefs, while broadcasting the information to non-patients may be helpful in changing general (cultural) beliefs about whiplash.

Although encouraging, these results should be viewed tentatively. The subjects were not randomly selected, not all those approached completed the evaluation forms, and there was no control group. Thus, there is the possibility of bias, and generalisability of the results could be questioned. While it is not possible to compare the belief shifts with previous data from WAD patients, the shifts found here correspond with those found for a similar booklet on back pain.^{15 20}

In summary, *The Whiplash Book* represents a useful adjunct to the set of evidence based clinical messages described in a previous paper.¹⁶ Indeed, educational experts advise that a coordinated approach, in which physicians and therapists all give the same information and advice, and use consistent educational material to reinforce that message, is likely to have a more powerful effect than either in isolation.²¹ While it is not unreasonable to expect an improvement in beliefs to be mirrored in behavioural change and clinical outcomes, the answer to that question rightly will require a randomised controlled trial.

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